Alaska Department of Fish and Game
Division of Wildlife Conservation
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Habitat Use, Foraging Behavior and Nutritional Ecology of Nelchina Caribou

William B. Collins

Research Performance Report
1 July 2002–30 June 2003
Federal Aid in Wildlife Restoration
Grant W-33-1, Study 3.47

This is a progress report on continuing research. Information may be refined at a later date.

FEDERAL AID
ANNUAL RESEARCH PERFORMANCE REPORT

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF WILDLIFE CONSERVATION
PO Box 25526
Juneau, AK 99802-5526

PROJECT TITLE: Habitat use, foraging behavior, and nutritional ecology of Nelchina caribou

PRINCIPAL INVESTIGATOR: William B. Collins

COOPERATORS:

FEDERAL AID GRANT PROGRAM: Wildlife Restoration

GRANT AND SEGMENT NR.: W-33-1

PROJECT NR.: 3.47

WORK LOCATION: Units 12, 13, and 20 E

STATE: Alaska

PERIOD: 1 July 2002 – 30 June 2003

I. PROGRESS ON PROJECT OBJECTIVES

OBJECTIVE 1: Lichen availability does not increase in linear manner relative to stand age.

I have measured lichen availability and corresponding stand age at approximately 340 sites in the Copper River Basin and in Unit 20 E. Data analysis is not complete, but lichen availability apparently does not increase linearly relative to stand age.

OBJECTIVE 2: In winter, Nelchina caribou habitat preference is not affected by lichen availability.

I have measured lichen availability at 100 sites in the Copper River Basin and at 240 sites in Unit 20 E. One half of these sites represent points selected by radiocollared caribou, and the other half represent random points. Initial results indicate strong caribou preference for sites having the most forage lichens. Data also indicate that caribou avoid sites younger than 50 years, because those sites have little or no forage lichens available.

OBJECTIVE 3: Digestible energy intake and digestive efficiency, including digestibility, rumen turnover and total passage rates of caribou, were not favored by high lichen availability.

Digestibility of individual forages, rumen turnover, and total passage rates have been determined for 6 tractable caribou in paddocks of 5 different levels of lichen availability. Initial results

indicate digestibility, rumen turnover rate, and total passage rate are positively correlated with availability of forage lichens.

OBJECTIVE 4: Forage lichen establishment and growth are not affected by substrate.

Work regarding this hypothesis is in progress, but I am concerned that treatments established to measure the effects of substrate have been too severely disturbed by natural forces to allow meaningful assessment.

OBJECTIVE 5: Branching of *Cladina* species is not indicative of lichen age.

Marked lichens are branching once per year.

OBJECTIVE 6: Summer forage quality is not enhanced by fire.

No work was done on this objective during this period.

II. SUMMARY OF WORK COMPLETED ON JOBS IDENTIFIED IN ANNUAL PLAN THIS PERIOD

JOB 1: Lichen cover and biomass

No additional work was done on this job this year.

Job 2: Relationships of lichen to stand age, topography

No additional work was done on this job this year.

Job 3: Diet versus lichen availability

Six tractable caribou, 3 of which were rumen fistulated, were grazed for periods of 1 week each in paddocks containing 0, 13, 26, 42, and 56 percent cover by forage lichens. Rumen and fecal samples were collected, and I began microhistlogical analysis of rumen contents.

JOB 4: Rumen turnover and total passage rates

A cobalt marker was administered to caribou used in Job 3 to assess rumen turnover and total passage rates. Results from winter 2002 were inconclusive due to problems with delivery of the cobalt solution at temperatures below –35 degrees Celsius. In winter 2003 a new approach involving placement of pumps directly into the rumen was successfully used. Laboratory analysis of cobalt concentrations was completed, and initial indications are that we will be able to successfully describe turnover and passage rates for caribou on different diets. It is readily conceivable that we will be able to transfer this technique to wild animals to determine intake and passage rate.

JOB 5: Activity budgets

Activity budgets were determined for a third and final year each in all treatments except that containing 0% cover by forage lichens. The 0% treatment was over run by wild caribou, making it unacceptable for the experiment. This treatment will be repeated in 2004. In the completed treatments the percentage of non-grazing activity characterized by rumenation increased with decreasing lichen availability.

JOB 6: Caribou condition relative to diet, activity, rumen turnover and total passage rates.

No additional work was done on this job.

JOB 7: Nelchina range stations

No additional work was done on this job.

JOB 8: Thallus branching

No additional work was done on this job.

JOB 9: Lichen response to substrate

No additional work was done on this job.

JOB 10: Nelchina summer forages

Thirty-six hundred feet of fencing for a holding pasture was completed near Square Lake, using techniques I have used successfully many times in other locations. Two days prior to introduction of the animals, a severe wind destroyed most of the fence. Consequently summer foraging trials were postponed until 2004. A new fence is being constructed in a more protected location.

JOB 11: In vivo digestibilities

In vivo digestibilities of the 14 principal forage items found in winter caribou diets were repeated by the nylon-bag technique in 2003, because mucous-like material in samples from winter 2002 led to poor filtering and digestibility estimates in samples that year. Laboratory analyses have not been completed for 2003.

JOB 12: Report writing

This is the only report that has been written regarding this work.

III. ADDITIONAL FEDERAL AID-FUNDED WORK NOT DESCRIBED ABOVE THAT WAS ACCOMPLISHED ON THIS PROJECT DURING THIS SEGMENT PERIOD

None

IV. PUBLICATIONS None

V. RECOMMENDATIONS FOR THIS PROJECT None at this time

VI. APPENDIX None

VII. PROJECT COSTS FOR THIS SEGMENT PERIOD

FEDERAL AID SHARE $ 21,300 STATE SHARE $ 7,100 = TOTAL $28,400

VIII. PREPARED BY:

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APPROVAL DATE: _____